

From Earth Missions to Deep Space Exploration (05)  
International Plans and Concepts (4)

Author: Dr. Jean-Claude Worms  
European Science Foundation, France, jcworms@esf.org

Mr. Nicolas Walter  
European Science Foundation, France, nwalter@esf.org

Dr. Stephane Blanc  
CNRS-IPHC, France, stephane.blanc@iphc.cnrs.fr

Dr. Bernard Comet  
MEDES - IMPS, France, bernard.comet@medes.fr

Prof. Rupert Gerzer  
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany, rupert.gerzer@dlr.de

Prof. Robert Hockey  
University of Sheffield, United Kingdom, g.r.j.hockey@sheffield.ac.uk

Dr. Natalie Leys  
Belgium, natalie.leys@sckcen.be

Dr. Günther Reitz  
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany, guenther.reitz@dlr.de

Mr. Laurent Braak  
MEDES, France, Laurent.Braak@medes.fr

Dr. Felice Mastroleo  
SCK-CEN, Belgium, felice.mastroleo@sckcen.be

Prof. Jean-Pierre Swings  
European Science Foundation, France, swings@astro.ulg.ac.be

TOWARDS HUMAN EXPLORATION OF SPACE – A EUROPEAN STRATEGY (THESEUS)

**Abstract**

Past space missions in Earth orbit have demonstrated that men can survive and work in space for long durations. However, there are pending technological, medical and psychological issues to be solved before adventuring in longer duration missions. Technological breakthroughs in life support systems and recycling technologies are also required to reduce the costs of these expeditions to acceptable levels. Solving these issues will need scientific and technological breakthroughs of interest for clinical and industrial applications and also allow identifying the relevance of these questions to health issues on Earth. Yet despite existing studies Europe still has no roadmap approved by its scientific and industrial communities. The objective of THESEUS is therefore to develop an integrated life sciences research roadmap enabling European human space exploration in synergy with ESA and, to the extent practicable, with strategies of other relevant international partners, taking advantage of the expertise available in Europe and identifying the potential of non space applications and dual research and development.

THESEUS has 3 main objectives: (i) identify disciplinary research priorities; (ii) focus on fields with high terrestrial application potential; and (iii) build a European network as the core of this strategy. THESEUS is a Coordination Action supported by the European Commission's 7th Framework Programme, running from 1 January 2010 to 31 March 2012. It is supported by 14 disciplinary Expert Groups grouped in 5 disciplinary clusters (integrated systems physiology; psychology and human-machine systems; space

radiation; habitat management; health care) that have started their work in cooperation with ESA Topical Teams. The kick-off conference, meetings of Expert Groups, and first integration meeting have already taken place, leading to draft reports. The last period of activity is devoted to the integration of these reports' findings (integration workshops in June and December 2011) and the identification of overarching recommendations. The final roadmap will be available at the time of the GLEX2012 conference. More information on: [www.theseus-eu.org](http://www.theseus-eu.org).